

November 2017

GORM Data Services

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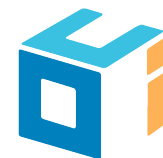
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Introductions

- Jeff Scott Brown
 - Grails Co-Founder
 - Grails Practice Lead
 - Co-Author
 - Definitive Guide To Grails
 - Definitive Guide To Grails 2
 - @jeffscottbrown



90% of OCI Clients are Repeat Clients



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aselsan
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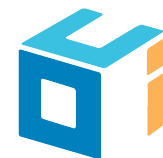


VOLTARI



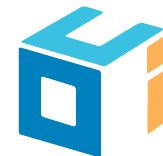

OCI | HOME TO GRAILS

- Team includes Grails co-founders & subject matter experts from around the globe
- Lead sponsor at G&G conferences around the globe
- 25+ updates & releases to the framework in the past 9 months
- Grails 3.3 GA released July 2017



Software Engineering Training

- ❑ 24+ years experience
- ❑ Over 50,000 trained
- ❑ 150 current courses
- ❑ More than 40 instructors on staff
- ❑ All training delivered by practitioners and SME's in their respective fields
- ❑ Customized to fit your specific needs
- ❑ Flexible training delivery
- ❑ Training assessments



Grails Online Training Workshops

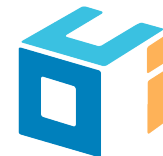
These live, instructor-led workshops will be delivered by Grails Co-Founder Jeff Scott Brown and other members of the Groovy and Grails core team.

**Coming up in December: Grails 3 and React!
Enroll Now at grailstraining.com**

Other workshops include:

- Introduction to REST Services with Grails 3
- GORM Deep Dive
- Groovy MetaProgramming

More workshops coming, check back often!



G3 Summit

The Conference for the Apache Groovy, Grails, and Gradle Community

SAVE \$200 WITH DISCOUNT CODE OCI200VIP



This year's event includes 8 full-day training workshops hosted by OCI Training and delivered by subject matter experts in the Groovy, Grails, and Gradle communities. These workshops are included in the standard conference registration fee ... an \$1,100 value!

Workshop participation will substantially increase your productivity with Groovy, Grails, and Gradle. Participants will spend a significant portion of the class with their hands on the keyboard, learning by doing, working through lab exercises designed to build on the presented material.

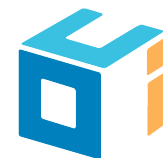
Querying

- GORM supports a number of ways to query including:
 - Dynamic Finders
 - Criteria
 - Where
 - HQL



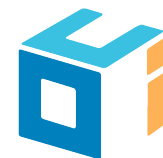
Dynamic Finders

- Automatically translate the properties of the class into "method expressions" - at runtime!
- Uses the Hibernate Criteria API underneath
- Rich and expressive way to query



Dynamic Finder Operators

- `InList` - In the list of given values
- `LessThan` - less than a given value
- `LessThanEquals` - less than or equal a give value
- `GreaterThan` - greater than a given value
- `GreaterThanEquals` - greater than or equal a given value
- `Like` - Equivalent to a SQL like expression
- `Ilike` - Similar to a `Like`, except case insensitive
- `NotEqual` - Negates equality
- `InRange` - Between the `from` and `to` values of a Groovy Range
- `Rlike` - Performs a Regexp LIKE in MySQL or Oracle otherwise falls back to `Like`
- `Between` - Between two values (requires two arguments)
- `IsNotNull` - Not a null value (doesn't take an argument)
- `IsNull` - Is a null value (doesn't take an argument)



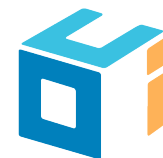
Dynamic Finders

```
def all = Bookmark.list()

// user like expressions
def railsBookmarks =
  Bookmark.findAllByTitleLike("%Grails%")

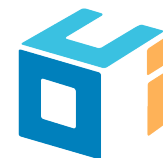
// query between two values
def now = new Date()
def lastWeeks =
  Bookmark.findByCreateDateBetween(now-7, now)

// query associations
def bookmark = Bookmark.get(34)
def comments = Comment.findAllByBookmark(bookmark)
```



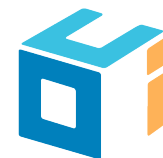
Querying with Criteria

```
// returns first 10 users who have an active
// account that has been created in the last
// 30 days and that have Grails-like
// bookmarks created in the last 7 days
def now = new Date()
def users = Bookmark.withCriteria {
    comments {
        like("text", "%Grails%")
        between("dateCreated", now-7, now)
    }
    between("dateCreated", now-30, now)
    maxResults(10)
}
```



Where Queries

- ❑ Use DetachedCriteria
- ❑ Compile time type checked
- ❑ Compatible with static compilation
- ❑ Use raw Groovy for criteria
- ❑ Are compose-able

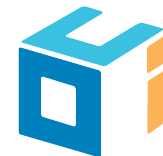


Where Queries

```
def query = Person.where {  
  age > 19  
  homeAddress.town == 'St. Louis'  
}  
def results = query.list()
```

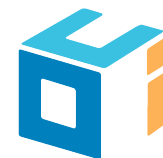
```
def adults = Person.where {  
  age > 18  
}
```

```
def adultsInStl = adults.where {  
  address.town == 'St. Louis'  
}  
def results = adultsInStl.list()
```



GORM Data Services

- Introduced In GORM 6.1
- Auto Generates A Data Service Layer
 - Less code to write
 - Compile time optimized
 - Easy Mocking
- Productivity Factor == HIGH
- Cool Factor == HIGH

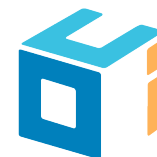


Simple Data Service

```
import grails.gorm.services.Service

@Service(Book)
interface BookService {
    Book getBook(Serializable id)
}
```

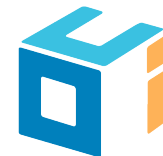
That is it. Just an interface. No implementation needs to be written.



Data Service Injection

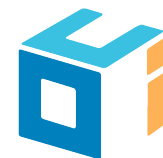
```
class BookController {  
    BookService bookService  
  
    def show(Long id) {  
        Book book = bookService.getBook(id)  
  
        // ...  
    }  
}
```

Just Works™!



GORM Data Services

- Supports abstract classes as well as interfaces
- All public methods are automatically made `@Transactional`
 - read-only for query methods
 - Can opt out with `@NotTransactional`



Abstract Data Service Class

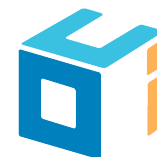
```
import grails.gorm.services.Service

@Service(Book)
abstract class BookService {

    protected abstract Book getBook(Serializable id)

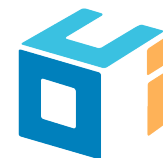
    protected abstract Author getAuthor(Serializable id)

    Book updateBook(Serializable id, Serializable authorId) {
        Book book = getBook(id)
        if(book != null) {
            Author author = getAuthor(authorId)
            if(author == null) {
                throw new IllegalArgumentException("Author does not exist")
            }
            book.author = author
            book.save()
        }
        return book
    }
}
```



Query Methods

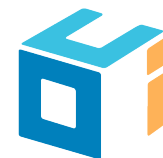
- count*, countBy*
- delete*
- find*, get*, list*, retrieve*
 - (all have *By* counterparts)
- save*, store*, persist*
- update*



Data Service Query Methods

```
import grails.gorm.services.Service

@Service(Book)
interface BookService {
    List<Book> findBooks(String title)
    List<Book> findBooks(String title, Map params)
    Book findBook(String title)
}
```



Data Service Dynamic Finder

```
import grails.gorm.services.Service
```

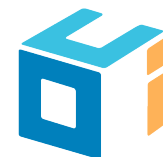
```
@Service(Book)
```

```
interface BookService {
```

```
    List<Book> findByTitleAndAuthor(String title,  
                                    String writer)
```

```
}
```

- ❑ Parameter names are not significant
- ❑ Poorly formed method name results in compile time error
 - Unlike traditional dynamic finders



Data Service Property Projection

```
import grails.gorm.services.Service
```

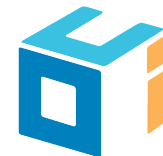
```
@Service(Book)
```

```
interface BookService {
```

```
    Date findBookReleaseDate(String title)
```

```
    List<String> findBookAuthor(String publisher)
```

```
}
```



Data Service Write Operations

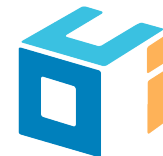
```
import grails.gorm.services.Service

@Service(Book)
interface BookService {
    Book saveBook(String title)

    Book saveBook(Book newBook)

    void delete(Serializable id)

    // first argument must be id...
    Book updateBook(Serializable id, String title)
}
```



Data Service Where Queries

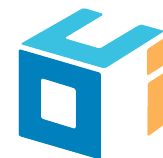
```
import grails.gorm.services.Service
import grails.gorm.services.Where
```

```
@Service(Book)
interface BookService {
```

```
    @Where({ title == title && releaseDate > date })
    void delete(String title, Date date)
```

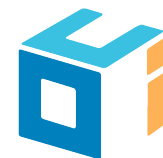
```
    @Where({ author == authorName &&
            releaseDate > fromDate })
    List<Book> searchBooks(String authorName,
                          Date fromDate)
```

```
}
```



GORM Outside Of Grails

- GORM For Hibernate
 - Simple to use outside of Grails
 - Declare dependencies
 - Annotate entities
 - Initialize Hibernate
 - Go!



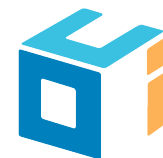
GORM Outside Of Grails

□ build.gradle

```
apply plugin: 'groovy'
```

```
repositories {  
    jcenter()  
}
```

```
dependencies {  
    compile 'org.codehaus.groovy:groovy:2.4.12'  
    compile "org.grails:grails-datastore-gorm-hibernate5:6.1.6.RELEASE"  
    runtime "com.h2database:h2:1.4.192"  
    runtime "org.apache.tomcat:tomcat-jdbc:8.5.0"  
    compile 'org.slf4j:slf4j-api:1.7.21'  
    runtime 'ch.qos.logback:logback-classic:1.1.7'  
}
```



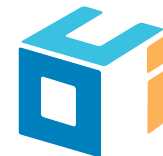
GORM Outside Of Grails

- Annotate entities

```
import grails.gorm.annotation.Entity
import org.grails.datastore.gorm.GormEntity
```

```
@Entity
class Person implements GormEntity<Person> {
    String firstName
    String lastName
    static constraints = {
        firstName blank:false
        lastName blank:false
    }
}
```

GormEntity is not strictly necessary.

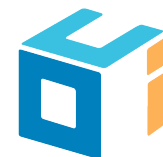


GORM Outside Of Grails

```
import org.grails.orm.hibernate.HibernateDatastore

// during application bootstrapping...
Map configuration = [
    'hibernate.hbm2ddl.auto': 'create-drop',
    'dataSource.url'         : 'jdbc:h2:mem:myDB'
]
new HibernateDatastore(configuration, Person)

// GORM is ready to go...
Person.withNewSession {
    def people = Person.list()
    for (Person p : people) {
        log.info "${p.lastName}, ${p.firstName}"
    }
}
```



Data Services Outside Of Grails

```
import grails.gorm.services.Service
```

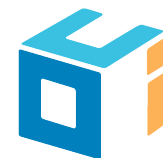
```
@Service(Person)
```

```
interface PersonService {
```

```
    List<Person> getPeople()
```

```
    Person savePerson(String firstName, String lastName)
```

```
}
```



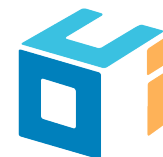
Data Services Outside Of Grails

```
import org.grails.orm.hibernate.HibernateDatastore

Map configuration = [
    'hibernate.hbm2ddl.auto': 'create-drop',
    'dataSource.url'         : 'jdbc:h2:mem:myDB'
]
def datastore = new HibernateDatastore(configuration, Person)
def service = datastore.getService(PersonService)

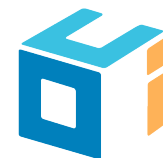
service.savePerson('Robert', 'Fripp')
service.savePerson('Jeff', 'Beck')
service.savePerson('David', 'Gilmour')
service.savePerson('Randy', 'Rhoads')

def people = service.getPeople()
for (Person p : people) {
    log.info "${p.lastName}, ${p.firstName}"
}
```



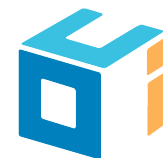
Multi Tenancy

- GORM 6 Supports Multi Tenancy
- Tenant Per...
 - DATABASE
 - SCHEMA
 - DISCRIMINATOR



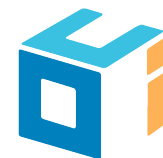
Database Per Tenant

- Database Per Tenant
- Most Secure Isolation
- Builds On GORMS Multiple Data Source Support



Database Per Tenant

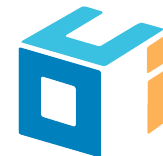
```
grails:  
  gorm:  
    multiTenancy:  
      mode: DATABASE  
      tenantResolverClass:  
org.grails.datastore.mapping.multitenancy.web.SubDomainTenantResolver  
dataSource:  
  dbCreate: create-drop  
  url: jdbc:h2:mem:books  
dataSources:  
  moreBooks:  
    url: jdbc:h2:mem:moreBooks  
  evenMoreBooks:  
    url: jdbc:h2:mem:evenMoreBooks
```



Tenant Resolvers

- o.g.d.m.multitenancy.resolvers.FixedTenantResolver
 - Fixed tenant id
- o.g.d.m.multitenancy.resolvers.SystemPropertyTenantResolver
 - gorm.tenantId system property
- o.g.d.m.multitenancy.web.SubDomainTenantResolver
 - Subdomain
- o.g.d.m.multitenancy.web.CookieTenantResolver
 - HTTP cookie named gorm.tenantId
- o.g.d.m.multitenancy.web.SessionTenantResolver
 - HTTP session variable named gorm.tenantId

org.grails.datastore.mapping...



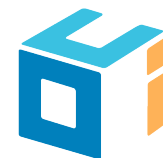
Multi Tenancy

```
class Book implements MultiTenant<Book> {  
    String title  
}
```

```
import static grails.gorm.multitenancy.Tenants.*
```

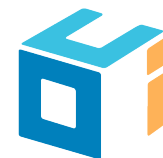
```
List<Book> books = withCurrent {  
    Book.list()  
}
```

```
List<Book> books = withId("moreBooks") {  
    Book.list()  
}
```



Summary

- Grails provides a convention-based wrapper around Hibernate called GORM
- GORM is immensely expressive thanks to its array of persistence and query methods
- Very little configuration needed



Q & A

Grails Community Information



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grailsblog.objectcomputing.com

grails.org

github.com/grails

grails.signup.team

objectcomputing.com/products/grails

grailstraining.com

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Grails Online Training Workshops

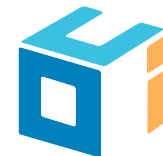
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